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RECENT LITERATURE

Edited by John A. Smallwood

NEW JOURNAL

(see 15, 16, 21)

1. Behavioral ecology. This new journal with a succinct title is the official organ of the International Society for Behavioral Ecology. The society was founded at the (first) International Meeting for Behavioral Ecology, held at the New York State Museum in 1986, when a general assembly of the participants voted to hold future meetings, form a society, and produce a peer-reviewed journal devoted to this field. The stated scope of the journal includes "original articles, reviews, and correspondence on all aspects of the field of behavioral ecology, encompassing both empirical and theoretical work and covering the [taxonomic] range from invertebrates to humans. The journal accepts papers in areas such as habitat selection; foraging, antipredator, mating, and parental care strategies; dispersal and migration; sexual selection; cooperation and conflict; communication; spacing and group behavior; and social organization." Seven of the 11 articles in the premier issue were generated from investigations of avian behavior, including five from field studies (three of these are reviewed below). This ratio may be indicative of the popularity of bird models among behavioral ecologists.

The journal is produced in an 8.5 by 11-inch format on coated stock, and each issue comprises 96 pages. Each cover will feature a black-and-white or color photograph of an animal "behaving ecologically." The first volume will consist of two issues, summer and fall, 1990; subsequent issues will be published quarterly. All members of the society receive the journal and a newsletter. Inquiries regarding membership and institutional subscriptions should be directed to the Journals Fulfillment Dept., Oxford University Press, 2001 Evans Rd., Cary, NC 27513 USA.—John A. Smallwood.

BANDING AND LONGEVITY

(see also 12, 18, 19)

2. Two methods for capturing tree-nesting birds at nests. B. Hilton, Jr. 1989. N. Am. Bird Bander 14:47–48.—The "double-halo" is a type of noose trap. The frame is made by bending a single coat hanger wire into a 13-cm diameter circular ring (the base), from which a 15-cm segment extends upward to support another 13-cm ring. To the top ring, which is directly above and parallel to the base, are attached an unspecified number of lightweight monofilament nooses. The elliptical nooses are about 5 cm by 7.5 cm, and are positioned so that they overlap slightly and form a curtain between the two metal rings. The trap is set by placing the base directly over an active nest and anchoring it to the tree branch with a heavier test piece of monofilament. Since the returning adult is caught by the neck, the deployed trap must be monitored continuously. Also, the trap should not be used during early incubation, because of the risk of nest abandonment, or if older nestlings are active enough to entangle themselves in the nooses. The author reported a 70% success rate for capturing breeding Blue Jays (*Cyanocitta cristata*) in central Minnesota.

The second capture method was a conventional mist net setup with taped fledgling alarm call playback. One or both target adults approached the net 80% of the time; the actual capture rate was not reported. [South Carolina Governor's School for Science and Mathematics, 306 East Home Ave., Hartsville, SC 29550 USA.]—John A. Smallwood.

3. A manual trap for capturing hole-nesting birds. W. B. Rendell, B. J. Stutchbury, and R. J. Robertson. 1989. N. Am. Bird Bander 14:109–111.—The authors describe an elegantly simple and effective hand-held trap for cavity nesting (or roosting) species. The basic design resembles a butterfly net, and consists of a pole-mounted wire basket frame covered with mist netting. The frame, made of 9–12 gauge wire, is formed by two hoops (diameters are 40 and 70 cm) connected by four 25-cm struts. The smaller hoop defines the entrance. A circular piece of mist netting (36-mm mesh) is stitched to the frame so that the face of the smaller hoop is open but the sides and back are covered. The netting is stretched

tightly across the sides and bottom third of the back. A piece of monofilament line spanning the larger hoop functions as a trammel line and helps the loose netting of the upper two-thirds of the back form a bag. The trap is operated by a single person, who holds the trap in place to enclose the entrance to the cavity containing the bird. The smaller hoop may be bent to conform to the tree trunk contours, thus minimizing the possibility of a bird escaping between the frame and the tree. The trap was used successfully to capture Tree Swallows (*Tachycineta bicolor*) and Bank Swallows (*Riparia riparia*). [Dept. of Biology, Queen's Univ., Kingston, ON K7L 3N6, Canada.]—John A. Smallwood.

4. A minimal-stress bird-capture technique. R. P. Wilson and M. T. J. Wilson. 1989. J. Wildl. Manage. 53:77–80.—The authors describe a sedative injection unit in which a radio-controlled servo motor designed for a model airplane was coupled to a hypodermic syringe and needle. The system was used successfully to administer intramuscular injections of ketamine hydrochloride to incubating or brooding African Penguins (*Spheniscus demersus*), Cape Gannets (*Morus capensis*), Bank Cormorants (*Phalacrocorax neglectus*), and Crowned Cormorants (*P. coronatus*). [Inst. für Meereskunde an der Univ. Kiel, Düsternbrooker Weg 20, D-2300 Kiel, Federal Republic of Germany.]—John A. Smallwood.

5. The AFMO Hi-lo: double height mist net utilizing a pivoted parallelogram support system. K. E. Heselton. 1990. N. Am. Bird Bander 15:13–16.—The "Hi-lo" is a system of two deployed mist nets, one above the other, supported by a pivoting structure which allows a single bander to switch the relative positions of the two nets periodically. As the bander lowers the top net to remove captured birds, the emptied lower net is raised simultaneously to the top position. The system was field tested at the Allegheny Front Migratory Observatory in West Virginia, where large concentrations of migrating passerines occur during autumn. Advantages of the system include ease of operation and, perhaps most importantly, the presence of an elevated net; 64.3% of 280 birds captured with the system were caught by the net in the upper position. Disadvantages include the system weight (>18 kg) and cost (up to $500 in materials and labor). [105 Haverhill Rd., Joppatowne, MD 21085 USA.]—John A. Smallwood.

6. Horizontal mist net for capturing upland nesting ducks. B. R. Bacon and J. O. Evrard. 1990. N. Am. Bird Bander 15:18–19.—The authors used a standard (3-m × 12.8-m) 10-cm mesh mist net stretched between two 3-m sections of conduit. Two persons held the net in a plane parallel to the ground while approaching the nest, and then quickly pulled the net down into the vegetation over the nest. The horizontal mist net was more effective than a long-handled hand net for first attempts to capture Mallard (*Anas platyrhynchos*) and Blue-winged Teal (*Anas discors*) hens (91% vs. 56% success), as well as for subsequent attempts when the initial attempt failed (55% vs. 41% success). [Wisconsin Dept. of Natural Resources, Suite 104, 990 Hillcrest, Baldwin, WI 54002 USA.]—John A. Smallwood.

7. Evaluation of techniques for capturing Common Ravens in southwestern Idaho. K. A. Engle and L. S. Young. 1989. N. Am. Bird Bander 14:5–8.—Five different trapping techniques were used in an effort to capture Common Ravens (*Corvus corax*) as part of a study of movement and habitat use. Leghold traps, drop-in traps, and rocket nets were deployed for 1015, 234, and 141 trap-hours, respectively. Noose traps (including *balchatri* traps and noose carpets) and a net gun were used less frequently (total of 40 trap-hours). Of 24 ravens captured, 23 were caught with leghold traps and one by the rocket net. Sixteen different baits were used with the leghold traps; no significant differences in success rate were detected among the eight items with which at least one raven was caught. Success with the leghold trap was highest during winter and spring, and lowest during summer. [Environmental Services Dept., Pacific Power and Light Co., 920 SW 6th Ave., 380 PFFC, Portland, OR 97204 USA.]—John A. Smallwood.

8. Aging and sexing Gray Catbirds by external characteristics. H. B. Suthers and D. D. Suthers. 1990. N. Am. Bird Bander 15:45–52.—Data from 1248 Gray Catbird (*Dumetella carolinensis*) encounters in New Jersey were used in discriminant function analyses to differentiate age categories and gender in this apparently monomorphic species. In an analysis of age, two functions correctly classified 90.2% of the sample from which they were derived. Iris color, mouth color, and the number of pairs of rectrices bearing pale gray

corners and tips contributed to the function that differentiated HY from older birds. Mouth color, wing chord, culmen length, difference in length between longest (sixth) and outermost (tenth) primary, tail length, difference in length between longest primary and longest secondary, and tongue color were important in discriminating SY from ASY birds. Iris color progressed with age from fledgling's gray through brown to reddish-black, and mouth color changed from yellow through pink and gray to black. Wing and tail length increased with age.

The discriminant functions for sex correctly classified 78.9% of the 242 birds of known gender used to derive the equations, and 78.0% of adult birds of known gender captured subsequently. Variables important for age discrimination included the length of the chestnut coloring on a central feather of the crissum, as measured along the shorter (of both webs) chestnut edge, culmen length, and color of mouth and tongue. [Dept. of Biology, Princeton Univ., Princeton, NJ 08544 USA.]—John A. Smallwood.

9. The pocket computer: a new tool for identifying eastern *Empidonax* flycatchers in the hand. R. H. Benson and K. L. P. Benson. 1989. N. Am. Bird Bander 14:79–82.—Measurements of wing chord, primary extension, bill length, bill width, tail length, and sixth primary emargination were collected from 85 study skins of Yellow-bellied Flycatchers (*Empidonax flaviventris*), Acadian Flycatchers (*E. virescens*), Alder Flycatchers (*E. alnorum*), Willow Flycatchers (*E. traillii*), and Least Flycatchers (*E. minimus*). Alder and Willow Flycatchers were grouped as Traill's Flycatchers for analysis. The six morphological characteristics were used in a discriminant function analysis which correctly identified 96% of an additional sample of 36 study skins. The authors present the four discriminant equations and a computational program written in BASIC for the Tandy® PC-4 pocket computer. [Dept. of Engineering Technology, Texas A&M Univ., College Station, TX 77843 USA.]—John A. Smallwood.

10. Longevity in the Blue Grouse. F. C. Zwickel, D. A. Boag, and J. F. Bendell. N. Am. Bird Bander 14:1–4.—This paper presents data gathered during a longitudinal study of Blue Grouse (*Dendragapus obscurus*) populations in southwestern Canada. Spring and summer banding and censusing operations were conducted on Vancouver Island, British Columbia, from 1962 to 1979 at one study site, and from 1959 to 1978 at a second study site. Banding and censusing at a third site in southwestern Alberta were conducted from 1955 to 1974. Longevity records were based on encounters which included resightings of live birds as well as reported hunting mortalities. By 1987, five males, one female, and one bird of unknown sex had attained 11 years of age. In addition, two males had reached 12 years and one male had been killed by a Northern Goshawk (*Accipiter gentilis*) at 14 years of age. Although the census and survivorship data from this study are not reported here, the authors cite the results of a life table analysis conducted previously on a nearby population of Blue Grouse (Bendell, Can. J. Zool. 33:195–223, 1955) which suggests that the longevities of the current study probably are at or near the maximum longevity which could be expected. The potential life span of Blue Grouse apparently is among the longest reported for any species of Tetraoninae. [Dept. of Zoology, Univ. of Alberta, Edmonton, AB T6G 2E9, Canada.]—John A. Smallwood.

MIGRATION, ORIENTATION, AND HOMING

(see also 21)

11. Homing pigeons do extract directional information from olfactory stimuli. P. Ioale, M. Nozzolini, and F. Papi. 1990. Behav. Ecol. Sociobiol. 26:301–305.—At the time of their fledging, two groups of pigeons (*Columba livia*) were placed in cages exposed to natural winds from all directions near Pisa, Italy. Occasionally, over a period of 56 days, an experimental group was exposed to an artificial wind carrying the scent of benzaldehyde (BA) from a constant direction. When both groups were exposed to BA during transportation and at the release site, individuals from the control group flew in a homeward direction. However, individuals from the experimental groups flew in a direction roughly opposite that of the BA-scented winds to which they were conditioned. When neither group was exposed to BA during transportation or at the release site, both groups flew in a homeward direction. These data support previous reports that pigeons can infer directional information

from olfactory stimuli perceived during the outward journey and/or at the release site. [Dipartimento di Scienze del Comportamento Animale dell'Universita di Pisa and Centro di Studio per la Faunistica ed Ecologia Tropicali del C.N.R., Firenze, Italy.]—Danny J. Ingold.

POPULATION DYNAMICS

(see 10, 12, 22)

NESTING AND REPRODUCTION

(see also 16, 17, 18, 20, 24)

12. Age of sexual maturity of Sandhill Cranes from mid-continental North America. T. D. Tacha, D. E. Haley, and P. A. Vohs. 1989. J. Wildl. Manage. 53:43–46.—A total of 393 juvenile Sandhill Cranes (*Grus canadensis*) were individually marked with numbered neckbands in Alaska, Texas, and Nebraska from 1975 to 1980. Seventy known-age birds subsequently were observed in Alaska, Saskatchewan, North Dakota, Nebraska, and Texas, where the social status was determined once each year for a total of 110 determinations. The earliest age at which pairing was observed was three years (one bird out of 14 observed three-year-olds). The youngest parents were five years of age (two of 13 observed five-year-olds). However, 76% of recruitment was from cranes at least eight years of age. [Dept. of Zoology, Southern Illinois Univ., Carbondale, IL 62901 USA.]—John A. Smallwood.

13. Breeding ecology of the Black Stork (*Ciconia nigra*). S. Hualong, L. Huanjin, and S. Shouyi. 1989. Acta Zoologica Sinica 35:444–446. (Chinese, English table and figure captions.)—This paper provides data on the dimensions of four nests, nest-site parameters (height, descriptive location, direction of exposure, past history) for 12 nests, and growth data and logistic equations for several characteristics of chicks from nestling age of day two through day 65. [Shanxi Inst. of Biology, Taiwan.]—Jerome A. Jackson.

14. Nest-site characteristics of White-headed Woodpeckers. K. A. Milne, and S. J. Hejl. 1989. J. Wildl. Manage. 53:50–56.—Fifty-three Northern White-headed Woodpecker (*Picoides a. albolarvatus*) nests were examined in the central and southern Sierra Nevada of California. Most nests were located in open canopied stands of mature and dead trees. Forty-three percent of the nests were in broken-topped snags, and mean nest height was 8 m. The woodpeckers nested closer to the ground than expected, considering available heights. The orientation of nest openings was evenly distributed, except for nests located in fallen logs or leaning snags; in these the opening was on the underside of the log or snag. [U.S. Forest Service, Pacific Southwest Forest and Range Experiment Station, 2081 E. Sierra Ave., Fresno, CA 93710 USA.]—John A. Smallwood.

15. Manipulations of male parental investment in polygynous Pied Flycatchers, *Ficedula hypoleuca*. J. T. Lifjeld and T. Slagsvold. 1990. Behav. Ecol. 1:48–54.—Males of the polygynous Pied Flycatcher give feeding priority to the brood of their first-acquired mate. The smaller the age difference between broods, the more the younger brood is fed. In the first of three field experiments, the authors manipulated the clutches of 11 males. For seven males, the eggs in the nest of the primary female (first-acquired) hatched first. For four males, the clutch incubated by the secondary female hatched first. The males favored the brood that hatched first, regardless of mating order. In the second experiment, the broods of seven males were switched; the four remaining males served as controls. The males continued to give priority to the older brood. In the third experiment, the clutches of primary and secondary females of 19 males were manipulated to hatch simultaneously. Males fed their two broods fairly equally. In all three experiments, the manipulations resulted in males caring for related as well as unrelated young. There was no effect of kinship. The manipulations also meant that incubation for primary females was prolonged, while that for secondary females was shortened, thus assuring asymmetry in the males' past investment (males provision both incubating females).

The results indicate that parental investment of male Pied Flycatchers is flexible. The authors suggest that the proximate cue for the response of the males is the intensity of

begging calls, which increase as the nestlings grow. The results are consistent with parental investment theory, which states that parents should invest their efforts based on expected benefits rather than past investment. [Zoological Museum, Univ. of Oslo, N-0562 Oslo 5, Norway.]—Kenneth D. Meyer.

BEHAVIOR

(see also 11, 15, 21, 22, 23, 24)

16. Deceptive use of alarm calls by male swallows (*Hirundo rustica*): a new paternity guard. A. P. Møller. 1990. Behav. Ecol. 1:1–6.—The author previously reported that females of the semicolonial Swallow left the nest area and engaged in extrapair copulations when they were not closely guarded by their mates. Extrapair copulations increased with colony size. He concluded that 26% of Swallow young were sired by extrapair males. In the present study, males of colonial (n = 32) and solitary (n = 13) pairs were observed after their mates had been chased from the nest to test the hypothesis that males deceptively use alarm calls to thwart extrapair copulations. During egg-laying, 91% of colonial males and 8% of solitary males gave intense alarm calls after returning to an unattended nest, despite the lack of predators. When a male called, all nearby swallows left the nesting area. There was little response by males of either class during the nest-building and incubation stages (0–13%). When a mount of a male Swallow was placed near solitary nests (n = 12), 59% of the males called during nest-building, 67% during egg-laying, and 0% during incubation. By disrupting extrapair copulations during their mate's fertile period, males were able to increase their certainty of paternity. Møller cites recent studies of birds and primates that also suggest the deceptive use of alarm calls. [Dept. of Zoology, Uppsala Univ., Uppsala, Sweden.]—Kenneth D. Meyer.

17. Male care, mate switching, and future reproductive success in a double-brooded passerine. J. Bart. 1990. Behav. Ecol. Sociobiol. 26:307–313.—Few hypotheses have been proposed which attempt to elucidate why some pairs of monogamous double-brooded birds keep the same mates, or switch mates after a first nest effort. The most common of these, success or failure of the first attempt, seems to hold well for some species, but not others. Kendeigh (Illinois Biol. Monogr. 18, 1941) discussed another possible factor, that of male care of young out of the nest. Kendeigh found that male House Wrens (*Troglodytes aedon*) in northern Ohio that cared for their young remated with the same female 65% of the time, whereas those that failed to care remated with the same female only 33% of the time. The author reanalyzed Kendeigh's data in an effort to compare the success in raising a second brood for males that had and had not cared for their fledglings. The analysis revealed that 45% of caring males lost their territories and failed to regain new ones while noncaring males lost only 9% of their territories. As a result, significantly fewer caring males were able to obtain mates for second nesting efforts. Thus, males had to choose whether to care for their fledglings, and perhaps enhance their chances of survival, or abandon them and concentrate their energy toward rearing a second brood. It is possible that males on better territories refused to provide parental care, since territorial loss would have been especially costly, whereas males on poorer territories would have been more inclined to care for their young upon nest departure. Moreover, males may have been more inclined to provide care if a large brood left the nest, and withhold such care if the brood was small. Regardless, this analysis emphasizes the importance in double-brooded birds, of the breeding territory being large enough to support the entire family unit, including the young until they have reached reproductive maturity. [Dept. of Zoology, The Ohio State Univ., Columbus, OH 43210 USA.]—Danny J. Ingold.

18. Philopatry and correlates of territorial fidelity in male Dickcissels. J. L. Zimmerman and E. J. Finck. 1989. N. Am. Bird Bander 14:83–85.—During a five-year study of a color-marked population, an average of 49% of male Dickcissels (*Spiza americana*) returned to the study area or the immediate vicinity each subsequent year. Such a philopatric male was considered territory faithful if the boundaries of his territory in one year overlapped any part of the previous year's territory. Territory fidelity was positively related to reproductive success. The probability that a male would return to the same territory in the following year was directly proportional to two measures of the degree of polygyny (mean

and maximum number of females residing in the male's territory, as determined by weekly censusing), to the number of nests, and (nonsignificantly) to the number of young produced. [Div. of Biology, Kansas State Univ., Manhattan, KS 66506 USA.]—John A. Smallwood.

19. Movements and activity patterns of the Light-footed Clapper Rail. R. Zembel, B. W. Massey, and J. M. Fancher. 1989. J. Wildl. Manage. 53:39–42.—Light-footed Clapper Rails (*Rallus longirostris levipes*) were studied in a 304-ha ecological reserve in California. Fifty-four rails were color-banded; nine of these birds also were radio-tagged. The detected movements of nontelemetered birds generally were <400 m. This distance was comparable to the maximum distances between telemetry fixes for radioed birds, 111–413 m. The mean home range estimate was 0.81 ha. Determination of activity patterns was based on visual observations of the four most frequently observed telemetered rails and one mate. Foraging activity was greatest during the 3-hr period after dawn and the 2-hr period before sunset. Roosting occurred during early morning and late evening only when the foraging substrate, mudflats associated with cordgrass (*Spartina foliosa*), pickleweed (*Salicornia virginica*), saltwort (*Batis maritima*), and jaumea (*Jaumea carnosa*) were inundated by high tides. Vocalizations were most frequent in the hour before sunset. [U.S. Fish and Wildlife Service, 24000 Avila Rd., Laguna Niguel, CA 92656 USA.]—John A. Smallwood.

ECOLOGY

(see 15, 16, 17, 18, 21, 22, 23, 24)

WILDLIFE MANAGEMENT AND ECONOMIC ORNITHOLOGY

20. Testing a raccoon's ability to raid a nest box. K. L. Berner, D. McGettigan, and S. Krieger. 1990. Sialia 12:83–87.—Using a captive semi-wild raccoon (*Procyon lotor*), the authors tested the effectiveness of several predator deterrent devices in Eastern Bluebird (*Sialia sialis*) nest boxes. Boxes were placed in pairs with each containing an artificial bluebird nest with dogfood. The raccoon was easily able to climb the pole upon which the boxes were mounted regardless of whether the mounting structure was a 2.2-cm smooth galvanized pipe or 2.5-cm plastic PVC pipe. A 1.9-cm thick wooden predator guard placed around the cavity entrance of the test box also failed to prevent the raccoon from obtaining food, as did an increase in the overall size of the test box. The only deterrent which seemed to inhibit the raccoon's ability to reach food in the boxes was an extended roof with a 17.8-cm overhang. The raccoon was excluded from the test box for several nights, although not completely, when equipped with such a super-extended roof. On the other hand, a roof with a 12.7-cm did not seem to deter the raccoon at all. These tests emphasize the flexibility and dexterity of this raccoon when attempting to overcome the various deterrent devices. The data suggest that the most promising and inexpensive feature for raccoon deterrence of bluebird nest boxes is a long roof extension. [State Univ. of New York, Cobleskill, NY 12043 USA.]—Danny J. Ingold.

CONSERVATION AND ENVIRONMENTAL QUALITY

(see 20)

MORPHOLOGY AND ANATOMY

(see 8, 9)

PLUMAGES AND MOLTS

(see 8, 9)

EVOLUTION AND GENETICS

(see 16, 17, 18, 24)

FOOD AND FEEDING

21. Energy demands of migration on red-eyed vireos, *Vireo olivaceus*. D. E. Loria and F. R. Moore. 1990. Behav. Ecol. 1:24–35.—Many neotropical migrants linger

along the northern coast of the Gulf of Mexico. This study addressed two questions concerning stopover ecology: How are length of stay and increase in mass related to condition on arrival? Does foraging behavior change to meet energy demands? From 1986 to 1988, mist-netted birds were banded, measured, weighed, and assigned to one of six categories of fat deposition. For birds that were recaptured, condition also was assessed by comparing ratios of mass to wing chord. Although many birds were lean, condition varied.

Initial observations of individual birds were used to quantify foraging behavior. The variables included vegetation height, foraging height, horizontal position, and foraging maneuver. Because within-day variation in mass was significantly less than between-day variation, foraging birds were assigned a condition (lean or fat) based on the average condition of birds captured that day.

Two patterns emerged. Lean birds were more likely to gain mass during the stopover, and birds that stayed only one day were more likely to lose mass. Fat-depleted migrants broadened their use of microhabitat but did not increase their vertical foraging range. They also increased both their feeding repertoire and degree of turning following feeding attempts. The authors suggest that fat-depleted birds are more likely to gain mass because they adjust their behavior to compensate for increased energy requirements. When the energy deficit is large, the cost of changing behavior is justified. [Dept. of Biological Sciences, Univ. of Southern Mississippi, Hattiesburg, MS 39406 USA.]—Kenneth D. Meyer.

22. Prey selectivity by Crowned Hawk-Eagles on monkeys in the Kibale Forest, Uganda. T. T. Struhsaker and M. Leakey. 1990. Behav. Ecol. Sociobiol. 26:435–443.—A pair of Crowned Hawk-Eagles (*Stephanoaetus coronatus*; CHE) were monitored at a nest in the Kibale Forest Reserve of west Uganda for 3.25 years in an area where a detailed 18-year study of the local primates was continuing. Estimates from the primate study allowed the authors to consider CHE prey selection, differential monkey mortality due to other causes, and how these factors may have contributed to a skew in the adult sex ratios of monkey populations. Monkeys were the most common prey item of CHE (83.7%) based on 49 predation cases (from direct and indirect evidence), and also dominated the samples of mammalian specimens that apparently were killed from other causes (88.9%). CHE clearly were selective in the prey that they took. Significantly fewer red colobus (*Colobus badius*) and more mangabeys (*Cercocebus albigena*) and black and white colobus (*Colobus guereza*) were killed than expected. There also were differences in CHE prey selection among age classes, with more young juvenile and infant red colobus being killed than expected. Notably, significantly more adult male and infant red colobus and fewer adult females and juveniles died from other causes. Among the remaining four monkey species, the data indicate just the opposite with significantly more adult males being preyed upon by CHE, while half of those dying from other causes also were adult males. CHE prey selectivity is consistent with the hypothesis that polyspecific groups of monkeys act as effective deterrents to predation. Indeed, red colobus and redtails (*Cercopithecus ascanius*), the two most abundant species, commonly associated with one another, and were preyed upon less than expected. Finally, these data indicate that CHE predation has a major impact on the adult/subadult populations of male blue (*C. mitis*) and black and white colobus, and both male and female mangabeys. This prey selectivity may account for the differential sex ratios existing in populations of these species as well as in redtails. The differential sex ratio in red colobus, on the other hand, was likely the result of fighting among adult males. [Dept. of Wildlife and Range Sciences, Univ. of Florida, Gainesville, FL 32611 USA.]—Danny J. Ingold.

23. Diet and optimal foraging of Great Gray Owls. E. L. Bull, M. G. Henjum and R. S. Rohweder. 1989. J. Wildl. Manage. 53:47–50.—The diet of Great Gray Owls (*Strix nebulosa*) breeding in northeastern Oregon was determined by collecting 1923 pellets at 58 active nests. Voles (*Microtus* spp.) occurred most frequently (52% of 4546 individual prey items) while northern pocket gophers (*Thomomys talpoides*) represented 67% of the estimated prey biomass. Ninety prey captures by eight nesting males were observed. Mean capture success was 33%. After each capture, a male either consumed or delivered the single prey to the nest. The foraging behavior of males was consistent with a prediction drawn from central place foraging theory: Small prey mostly were consumed while larger prey were transported to the nest. [U.S. Forest Service, Forestry and Range Sciences Lab., La Grande, OR 97850 USA.]—John A. Smallwood.

SONGS AND VOCALIZATIONS

(see also 16)

24. Does the "Teer" vocalization deter prospecting female Red-winged Blackbirds? K. Yasukawa. Behav. Ecol. Sociobiol. 26:421–426.—One hypothesis for the "Teer" call given by female Red-winged Blackbirds (*Agelaius phoeniceus*) early in the breeding season is that it serves to limit the number of new females on a male's territory. In order to test this hypothesis, the author conducted a series of speaker-occupation experiments (using tape recordings and pairs of speakers to "defend" territories) during the 1987–1989 breeding seasons in Rock County, Wisconsin. Observations showed that significantly more "speaker territories" were settled by female Red-wings before the unoccupied control territories were. However, no significant difference was detected in the rate at which prospecting females visited control and speaker territories, or in the numbers of residents they attracted. Finally, females that settled on speaker territories sang the Teer call significantly more than females on control territories. These data do not ostensibly support any of the predictions of the "vocal deterrence hypothesis" stated at the outset, which casts some doubt over the function of the Teer call. Since Teers given in the absence of an actual resident seemed in fact to attract females, it may be that this call functions to establish dominance relationships among females sharing a male's territory. [Beloit College, Dept. of Biology, Beloit, WI 53511 USA.]—Danny J. Ingold.

25. Identification of individual breeding Bald Eagles by voice analysis. W. L. Eakle, R. W. Mannan, and T. G. Grubb. 1989. J. Wildl. Manage. 53:450–455.—The objectives of this study were to determine if individual members of an Arizona Bald Eagle (*Haliaeetus leucocephalus*) population could be identified by characteristics of their chatter calls, and if the calls of individual eagles remained consistent within and between years. Recordings were obtained from five to 22 adults during four breeding seasons. All but two of the eagles were wild, free-ranging birds. For each call sequence, sound spectrograms were generated and notes were classified visually into broad morphological types. In addition, nine vocal characteristics of each call sequence were measured: (1) number of notes per call sequence, (2) note duration, (3) inter-note duration, (4) call sequence duration, (5) strongest frequency, (6) highest frequency, (7) lowest frequency, (8) frequency range, and (9) number of frequency bands. The characteristics of notes and call sequences which best differentiated individual eagles within a given year were determined by stepwise discriminant function analysis. Note duration, lowest frequency, and highest frequency were important in the analysis of call sequences. Strongest frequency, note duration, lowest frequency, and highest frequency were the most important discriminating characteristics of notes. Eagles were considered correctly identified if >50% or a plurality of its calls were classified correctly. From 83–100% of the eagles could be identified by voice in a given year. No single call sequence or note characteristic remained constant for all eagles within or between years. However, the variation through time in call features of individual eagles was less than the variation among different eagles. This finding suggests the possibility of using this technique to identify individual eagles in the field between years. The authors point out, however, that the current sample size is insufficient to determine the potential rate of error. [U.S. Air Force, 832 Civil Engineering Squadron, Environmental Planning Branch, Luke AFB, AZ 85309 USA.]—John A. Smallwood.